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ABSTRACT

The effects of two types of contingency contracts and self-pacing on student performance in a personalized system of instruction (PSI) class were examined. Forty-seven college students in a principles of educational psychology class were randomly assigned to either a short contract, long contract or self-pacing group. One group of students signed a short contract requiring mastery (90 percent) of the first unit within 3 class days, while another group signed a longer contract. A final group of students were self-pacing from the beginning of the course, and no contract was signed. Students in the three groups were also assigned to peer tutors. Analysis of covariance (with grade point average and student classification as covariates) yielded significant differences only on the final examination among the three groups. Multiple t-test comparisons indicated that both the self-pacing group and the short contract group performed significantly higher than did the long contract group on the final examination. (Author/SW)

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Contingency Contracting in a Personalized System of Instruction Class

by

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Abstract

This study examined the effects of two types of contingency contracts and self-pacing on student performance in a PSI class. Forty-seven college students in a principles of educational psychology class were randomly assigned to either a short contract, long contract, or self-pacing group. Analysis of covariance (with GPA and student's classification as covariates) yielded significant differences only on the final examination among the three groups; multiple *t* comparisons indicated that both the self-pacing group and the short contract group performed significantly higher than the long contract group on the final examination.

Contingency Contracting in a Personalized System of Instruction Class

Introduction

This study examined the effects of two types of contingency contracts and self-pacing on student performance in a Personalized System of Instruction (PSI) class. The course was offered during a Fall semester and was 15 weeks in duration. Course material was divided into 12 units; students were allowed three attempts to master each unit.

Semb, Glick, and Spencer (1979) have identified delayed student work patterns or "procrastination" as a major reason for lack of completion and student withdrawal from courses using a PSI approach. Several investigators (Davis & Semb, Note 1; Wesp & Ford, 1982) have found contingency management to be effective in dealing with procrastination. Brooke and Ruthven (Note 2) found a long contract group (requiring completion of six units by designated deadlines) performed significantly higher on the final examination in a PSI course (taught during a four-week term) than did a self-pacing group and a short contract group (requiring completion of one unit by a designated deadline). Brooke and Ruthven speculated about the effect that the brevity of the term may have had upon the results.

Method

The subjects were 47 college students enrolled in a principles of educational psychology class. There were two experimental groups (Groups SC and LC) and a control group (SP). Students were randomly assigned to three groups.

Students in Group SC signed a short contract which required mastery (90%) of the first unit within three class days. If the student did not

complete the contract by the designated date, another contract deadline was agreed upon for completion of the next unit. This was continued until the contract was met and self-pacing was earned.

Students in Group LC signed a longer contract which first required mastery (90%) of the first unit within three class days; at which time, another part of the contract stating a deadline of six class days for completion of the next two units was signed. Upon successful completion of the two-unit part of the contract, a three-unit contract requiring completion within nine class days was signed. If the student did not complete any part of the contract by the designated date, that part of the contract was re-negotiated. When that part of the contract was met, the next contract deadline was agreed upon until the three-unit contract deadline was reached and self-pacing was earned.

Students in Group SP were totally self-pacing from the beginning of the course; no contract was signed by these students.

Five undergraduate students served as peer tutors/proctors. All of the peer tutors had previously taken and earned A's in the principles of educational psychology course. Students in the three groups were randomly assigned to the five peer tutors. The students rotated to a different peer tutor on a three-week basis.

The dependent variables in the study were rate of withdrawal from the course, final examination scores, scores on the Survey of Study Habits and Attitudes (SSHA), number of test retakes, and number of tests taken during five equal parts of the semester. The SSHA was administered whenever the student completed all 12 units. The final examination was administered on an individual basis to all students who completed all 12 units two weeks before the end of the semester. The students who did not complete the

course by this two-week deadline were administered the final examination as a group during the regularly scheduled exam period. Grades were assigned on the following basis. For an A, B, or C, the student had to master 10, 8, or 6 of the 12 units, respectively, and attain at least 70%, 60%, or 50% on the final exam, respectively. No D's were given in the course; if the student did not meet the requirements for a C, an F was assigned. If the student did not complete all 12 units by the end of the semester, an I (incomplete) was assigned.

Results

Two of the 16 students in Group SP withdrew from the course, one before attempting any units and one after attempting the first six units. Three students in this group received an I at the end of the semester; all three completed the course the following semester. One student was omitted from the analyses because of incomplete data. See Table 1 for the other grades made by students in the three groups.

Four of the 16 students in Group SC either dropped or withdrew from the course; two dropped before attempting any units, and one passed the first two units and withdrew. One student received a F; she attempted the first unit only, but failed to officially drop the course. One student in this group received an I and completed the course the following semester.

Two students of the 15 in Group LC dropped the course; one before signing the contract and one before attempting any units. One student received a F; he attempted the first unit only, but failed to officially drop the course. One student was omitted from the analyses because of incomplete data. Therefore, the rate of withdrawal was approximately equal for the three groups.

Utilizing an one-way analysis of covariance with GPA and student's classification as covariates, a significant difference, $F(2, 30) = 4.59$,

$p < .05$, was found between the adjusted means of the three groups on the final examination (see Tables 2 & 3). Multiple t comparisons led to the conclusion that both Group SP (adj. M = 81.05) and Group SC (adj. M = 82.28) performed significantly higher than Group LC (adj. M = 71.75) with $p < .05$ (see Table 4). No significant differences were found among the three groups on any other dependent variables (see Tables 5 and 6 for data on these variables).

Discussion

The results seem to imply that contingency contracting did not significantly improve students' performance on the final examination in this PSI course, since the self-pacing students performed nearly as well as the students in the short contract group and better than the students in the long contract group. In fact, it seems that the long contract may have been detrimental rather than beneficial to these students. The results were surprising since they were quite different from the earlier study done by Brooke and Ruthven (Note 2) using essentially the same contracts. Even though there were some logistical differences (12 units vs. 10 units, three vs. two attempts allowed for mastery,and 90% vs. 80% mastery) between this course and the course studied by Brooke and Ruthven, it seems that the length of the course (15 weeks vs. four weeks) may have substantial bearing upon the effectiveness of contingency contracts in improving student performance. When the short and long contracts were used during a four-week summer term, students in the long contract group performed significantly higher on the final examination than the short contract and self-pacing groups (Note 2).

TABLE I

Assignment of Grades by Group

Grade	Group SP	Group SC	Group LC	Total
A	9	10	9	28
B	2	0	1	3
C	0	0	2	2
F	0	1	1	2
*I	3	1	0	4
**WD	2	4	2	8
				47

*I = Incomplete

**WD = Withdrew or Dropped

TABLE 2

Analysis of Covariance Summary Table

Source	DF	MS	F
Between Groups	2	355,78	4.59*
Within Groups	30	77,46	
Total	32		

*P < .05

TABLE 3

Means and Standard Deviations for the Three Groups on Final Exam Scores

Group	N	M	ADJ. M	SD
SP	13	77.71	81.05	13.66
SC	11	82.36	82.28	15.54
LC	11	74.67	71.75	12.94

TABLE 4

T-test Matrix for Adjusted Group Means

	SP	SC	LC
SP	.00		
SC	.33	.00	
LC	-2.47*	-2.79*	.00

P < .05

TABLE 5

Means on the Scales of the Survey of Study Habits and Attitudes

	Self-Paced	Short Contract	Long Contract
Delay Avoidance (DA)	16.15	23.27	24.00
Work Methods (WM)	24.62	27.91	26.18
Study Habits (DA + (WM)	40.77	51.18	50.18
Teacher Acceptance (TA)	27.08	33.55	30.82
Educa. Acceptance (EA)	25.92	31.55	29.00
Study Attitudes (TA + EA)	53.00	65.09	59.82
Study Orient. (SH + SA)	93.77	116.27	110.00

TABLE 6

Means of Other Variables

	Self-Paced	Short Contract	Long Contract
Number of Retakes	3.38	3.18	5.36
Grade Point Average	2.90	3.00	3.16